

REMARKS

Reconsideration of the present application is requested. Claims 2 and 9 have been canceled without prejudice or disclaimer. Claims 1, 3-8, and 10-34 remain pending. Of those, claims 24-31 are withdrawn, and claims 1, 3-8, 10-23 and 32-34 are under examination.

ALLOWABLE SUBJECT MATTER

Applicants appreciate the indication that claim 22 defines allowable subject matter. Applicants appreciate the allowance of claim 34.

REJECTION UNDER 35 U.S.C. § 101

Claims 1-7 and 32-33 stand rejected under 35 U.S.C. § 101 as being directed non-statutory subject matter. Although Applicants do not necessarily agree with this rejection, Applicants have amended claims 1, 6, 32, and 33 taking into account the Examiner's comments. Specifically, for example, claim 1 now recites "selectively performing, by an interlaced-to-progressive (IPC) converter, one of at least two interlaced-to-progressive conversion (IPC) techniques on input interlaced scan data based on a received control command," and thus, is now tied to another statutory category; namely an "interlaced-to-progressive (IPC) converter." Therefore, withdrawal of this rejection is requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-4, 6, 8-21 and 23 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5, 943,099 ("Kim") in view of U.S. Patent No. 5,019,903 ("Dougall"). This rejection is respectfully traversed.

Beginning at page 4, the Office Action correctly recognizes that Kim's conversion apparatus does not generate "*at least one scan line including spatio-temporal pixel values, each spatio-temporal pixel value being a combination of a spatially interpolated pixel value and a temporally interpolated pixel value*" as required by claim 1. To account for this apparent deficiency, the Office Action states at page 4:

Kim also teaches in the Related Art that, recently, the interlaced-to-progressive conversion apparatus has become more important since a high definition (resolution) television (HDTV) system adopts a plurality of standards on signal formats and the conversion among stand input/output signals of various formats is required frequently (see col. 1, lines 21-26).

The Office Action then concludes, at page 4:

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the conversion among the standard input/output signals of various formats as taught in Kim's Related Art into Kim's system in order to display different video signals having different format on different television receivers.

Applicants fail to understand this rationale. Kim does not disclose or fairly suggest any generating of "*at least one scan line including spatio-temporal pixel values, each spatio-temporal pixel value being a combination of a spatially interpolated pixel value and a temporally interpolated pixel value*" as required by claim 1.

In the conversion device of Kim, a correlator 130 detects a motion correlation DM, a vertical direction correlation DV and a temporal-vertical correlation DT from the input interlaced image signal. The correlations DM, DV and DT are output to a selector 140, which compares the motion correlation DM, the vertical correlation DV and the temporal-vertical correlation DT with predetermined constants TM, T1 and T2, respectively. The selector 140 then selects one of a spatially interpolated signal Is output from the spatial interpolator 110 or a temporally interpolated signal It output by the temporal interpolator 120 based on the comparison results. The selected signal is output by the selector 140 as an interpolated signal Vout. Contrary to claim 1, Kim does not combine *the separately interpolated signals or spatial and temporal interpolated pixel values*. Thus, Kim does not disclose or fairly suggest "generating at least one scan line including spatio-temporal pixel values, each spatio-temporal pixel value being a combination of a spatially interpolated pixel value and a temporally interpolated pixel value" as required by claim 1.

Further, at page 4, the Office Action appears to direct Applicants' attention to lines 21-26 in column 1 of Kim to support the conclusion that the "generating" of claim 1 is obvious in view of Kim. Lines 21-26 in column 1 of Kim state:

Recently, the interlaced-to-progressive conversion apparatus has become more important since a high definition (resolution) television (HDTV) system adopts a plurality of standards on signal formats and the conversion among standard input/output signals of various formats is required frequently.

At best, this portion of Kim discloses that HDTV has a plurality of different standard signal formats, and that conversion among these formats is performed frequently. But, this broad, general statement regarding the importance of interlaced-to-progressive conversion apparatuses does not disclose, suggest or otherwise imply anything regarding generation of scan lines including spatio-temporal pixel values, each of which are a combination of a spatially interpolated pixel value and a temporally interpolated pixel value.

In further addressing the above-mentioned deficiencies of Kim with regard to claim 1, the Office Action directs Applicants' attention to Dougall stating at pages 4 and 5:

Additionally, Dougall et al teach that a mixed or switched 114 output is substantially wholly a spatially interpolated signal in moving areas and substantially wholly a temporal interpolated (filtered) signal in static picture areas, though it might be possible to mix the two signals in respective proportions over some or the whole of a picture area.

The Office Action, at page 5, directs Applicants' attention to FIG. 16 and column 15, lines 45-66 to support this statement.

In the embodiment shown in FIG. 16 of Dougall, "[the] input digital video signal to the spatial interpolation apparatus of FIG. 11 on the bus 10 is supplied also to a temporal filter 110 ... and to a local movement detector 112. The bus 68 from the output of the spatial interpolation apparatus is connected to one input of a device 114 which may be a switch or a mixer." Dougall at 15:49-56. The temporal filter 110 is connected to another input of the device 114 via an output bus 116. *Id.*

According to lines 59-66 in column 15 of Dougall, a "mixed or switched output is produced on a bus 118," and the signal on the bus 118 "could as mentioned above, be substantially wholly a spatially interpolated signal in moving picture areas and substantially wholly a temporally interpolated (filtered) signal in static picture areas, though it might be possible to mix the two signals in respective proportions over some or the whole of a picture area."

Although Dougall discloses that it might be possible to mix spatially and temporally interpolated signals, Dougall does not disclose the mixing of signals on a *per-pixel value basis* as required by claim 1. Indeed, claim 1 requires "*generating at least one scan line including spatio-temporal pixel values, each spatio-temporal pixel value being a combination of a spatially interpolated pixel value and a temporally interpolated pixel value.*" Thus, claim 1 does not merely require combining spatially and temporally interpolated signals, but rather that "*each spatio-temporal pixel value [is] a combination of a spatially interpolated pixel value and a temporally interpolated pixel value.*" Such a specific combination is not disclosed or suggested by Dougall.

Moving forward, claim 1 further requires, a control command that "indicates to perform one of at least a spatial interpolation IPC technique and a spatial/temporal interpolation IPC technique," which generates at least one scan line including spatio-temporal pixel values. Such a "control command" is also not disclosed or fairly suggested by Kim and/or Dougall, taken singly or in combination.

At page 5, for example, the Office Action directs Applicants' attention to Kim to disclose the "control command" of claim 1. Specifically, page 5 of the Office Action directs Applicants' attention to FIG. 1, column 3, line 48 to column 4, line 21 and column 6, line 50 to column 7, line 32 of Kim to disclose this feature. Applicants disagree

According to column 3, line 66 through column 4, line 5 of Kim:

The selector 140 compares the motion correlation DM, the vertical correlation DV, and the temporal-vertical correlation DT with predetermined constants TM, T1, and T2, respectively, and selects a signal Is output by the spatial interpolator 110 or a signal It output by the temporal interpolator 120 on the basis of the compared results as an interpolated signal Vout.

At best, the above-recited portion of Kim discloses a selector 140, which selects one of a spatially interpolated signal Is or a temporally interpolated signal It on the basis of a comparison between different correlations. This portion of Kim does not disclose, suggest or otherwise mention any "control command" in response to which *one of at least a spatial interpolation IPC technique and a spatial/temporal interpolation IPC technique* is performed.

Further, at column 6, line 50 through column 7, line 32, Kim describes FIG. 4, which shows a flow chart describing a method for "switching the spatial or the temporal interpolated signals." See, also, Kim at 3:37-38. This portion of Kim, however, also does not disclose, suggest or otherwise mention any "control command" in response to which *one of at least a spatial interpolation IPC technique and a spatial/temporal interpolation IPC technique* is performed.

Moving forward, although Dougall discloses that it might be possible to mix spatially and temporally interpolated signals, Dougall does not disclose or

fairly suggest any control command in response to which *one of at least a spatial interpolation IPC technique and a spatial/temporal interpolation IPC technique* is performed. Therefore, Dougall fails to make up for the above-mentioned deficiencies of Kim with regard to claim 1.

For at least the foregoing reasons, Kim in view of Dougall (assuming *arguendo* that these references could be combined, which Applicants do not admit) fails to disclose or fairly suggest at least "*the control command indicates to perform one of at least a spatial interpolation IPC technique and a spatial/temporal interpolation IPC technique generating at least one scan line including spatio-temporal pixel values, each spatio-temporal pixel value being a combination of a spatially interpolated pixel value and a temporally interpolated pixel value*" as required by claim 1. Therefore, claim 1 is not rendered obvious over Kim in view of Dougall.

Claims 6, 8, 12, 32 and 33 are not rendered obvious over Kim in view of Dougall for at least reasons somewhat similar to those set forth above with regard to claim 1.

Claims 3-5, 7, 9-11, 13-21 and 23 are not rendered obvious by Kim in view of Dougall at least by virtue of their dependency from claims 1, 6, 8, 12, 32, and 33.

CONCLUSION

Accordingly, in view of the above amendments and remarks, reconsideration of the objections and rejections and allowance of each of the pending claims is earnestly solicited.

If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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